

AMENDMENTS TO THE CLAIMS:

Please cancel claims 3 and 48 without prejudice, and amend claims 25 and 56 as set forth below.

This listing of claims will replace all prior versions and listings of claims in the Application:

Claim 1 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region;

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby to drive charged particles from the moving gas stream and deposit said charged particles as oppositely charged layers on said dielectric substrate thus forming a built-up deposit; and

collecting or recirculating the moving gas stream in a closed system.

Claims 2 -3 (cancelled)

Claim 4 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region;

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein said aerosol particles comprise particles of dry powder; and

collecting or recirculating the moving gas stream in a closed system.

Claim 5 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region;

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein said aerosol particles comprise liquid droplets; and

collecting or recirculating the moving gas stream in a closed system.

Claim 6 (original): The method according to claim 4, wherein said dry powder particles are triboelectrically charged.

Claim 7 (previously presented): The method according to claim 1, wherein said aerosol particles comprise liquid droplets charged by a charge injector.

Claim 8 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region;

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein said aerosol particles comprise a pharmaceutical; and

collecting or recirculating the moving gas stream in a closed system.

Claim 9 (original): The method according to claim 4, wherein said dry powder particles comprise carrier particles coated with a bioactive agent.

Claims 10-13 (canceled)

Claim 14 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region;

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein said alternating electric field has a magnitude between 1 kV/cm and 30 kV/cm;
and

collecting or recirculating the moving gas stream in a closed system.

Claim 15 (previously presented): The method according to claim 14, wherein said alternating electric field has a frequency of between 1 Hz and 100 kHz.

Claim 16 (previously presented): The method according to claim 14, wherein said alternating field has a duty cycle different than 50%.

Claim 17 (original): The method according to claim 16, wherein said duty cycle is 90%.

Claim 18 (previously presented): The method according to claim 14, wherein said alternating electric field is formed between a first electrode positioned at an end of said deposition zone opposite to and facing said dielectric substrate and a second electrode in contact with said dielectric substrate on the opposite side of where said deposit is formed.

Claim 19 (original): The method according to claim 18, wherein said first electrode is an element of an ion emitter.

Claim 20 (original): The method according to claim 19, wherein said aerosol particles are discharged after being deposited.

Claim 21 (original): The method according to claim 18, wherein the contact area of said second electrode with said dielectric substrate determines the location of said deposition.

Claim 22 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region; transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region;

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein substantially all of said aerosol particles are removed from said aerosol to form said deposit; and

collecting or recirculating the moving gas stream in a closed system.

Claim 23 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region; transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region;

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein the gas of said aerosol is selected from the group consisting of air, nitrogen, and nitrogen/carbon dioxide mixtures; and

collecting or recirculating the moving gas stream in a closed system.

Claim 24 (canceled)

Claim 25 (currently amended): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region;

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the [[the]] moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein said dielectric substrate comprises a packaging medium; and

collecting or recirculating the moving gas stream in a closed system.

Claim 26 (previously presented): A method according to claim 25, wherein said packaging medium comprises a blister, tablet, capsule or tubule.

Claim 27 (original): The method according to claim 26, wherein the blister comprises a plastic or metal foil blister package.

Claim 28 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region;

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein said dielectric substrate comprises a pharmaceutical carrier; and

collecting or recirculating the moving gas stream in a closed system.

Claim 29 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region;

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein said dielectric substrate comprises a carrier for carrying said deposit from said deposition zone to a location remote from said deposition zone for further processing; and
collecting or recirculating the moving gas stream in a closed system.

Claim 30 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region; and

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit, wherein said dielectric substrate is edible.

Claim 31 (canceled)

Claim 32 (previously presented): The method according to claim 34, wherein said ion emitter comprises a silent electric discharge device.

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Claim 33 (previously presented): The method according to claim 34, wherein said ion emitter comprises an ion radiation source.

Claim 34 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region in which a deposition zone is located proximate to said dielectric substrate and applying a charge on said particles in said second region;

applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein said aerosol particles are charged by an ion emitter; and

collecting or recirculating the moving gas stream in a closed system.

Claim 35 (previously presented): The method according to claim 22, wherein the mass of said deposit is controlled by integrating the mass of said aerosol particles over time.

Claim 36 (previously presented): The method according to claim 35, where said time is determined by the measured mass of said aerosol particles.

Claim 37 (previously presented): The method according to claim 22, wherein multiple deposits are made using multiple deposition zones supplied from a single aerosol source by multiplexing the application of the alternating deposition field between the deposition zones.

Claims 38-48 (canceled)

Claim 49 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region and applying a charge on said particles in said second region;

positioning said charged aerosol particles in a deposition zone located in said second region proximate to said dielectric substrate, and applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein said particles comprise a solid or a liquid; and

collecting or recirculating the moving gas stream in a closed system.

Claim 50 (canceled)

Claim 51 (previously presented): The method according to claim 49, wherein said particles comprise carrier particles coated with a bioactive agent.

Claim 52 (previously presented): A method for depositing particles onto a surface of a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;

providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby charged particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said dielectric substrate opposite said underlying electrode, wherein said particles comprise a pharmaceutical; and

collecting or recirculating the moving gas stream in a closed system.

Claim 53 (previously presented): A method for depositing particles onto a surface of a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;

providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby charged particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said dielectric substrate opposite said underlying electrode, wherein said aerosol carrier is nitrogen gas; and

collecting or recirculating the moving gas stream in a closed system.

Claim 54 (previously presented): A method for depositing particles onto a surface of a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;

providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby charged particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said substrate opposite said underlying electrode,

wherein said dielectric substrate comprises a blister pack; and
collecting or recirculating the moving gas stream in a closed system.

Claim 55 (previously presented): A method for depositing particles onto a surface of a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;

providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby charged particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said dielectric substrate opposite said underlying electrode,

wherein said dielectric substrate comprises an electrically insulating material; and
collecting or recirculating the moving gas stream in a closed system.

Claim 56 (currently amended): A method for depositing particles onto a surface of a [[unitary]] dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;

providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby charged particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said dielectric substrate opposite said underlying electrode,

wherein said dielectric substrate is comprised of an electrically conducting material;
and

collecting or recirculating the moving gas stream in a closed system.

Claim 57 (previously presented): A method for depositing particles onto a surface of a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;

providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby charged particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said dielectric substrate opposite said underlying electrode,

wherein said electrically charging means employs a corona wire or corona emitting points; and

collecting or recirculating the moving gas stream in a closed system.

Claim 58 (canceled)

Claim 59 (previously presented): A method for depositing particles onto a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

transporting the resulting aerosol as a moving gas stream to a second region and applying a charge on said aerosol particles in said second region;

positioning said charged aerosol particles in a deposition zone located in said second region proximate to said dielectric substrate, and applying an alternating electric field formed in said deposition zone between a first electrode positioned in said second region and a second electrode positioned underlying and in contact with said dielectric substrate whereby charged particles are removed from the moving gas stream and deposited as oppositely charged layers on said dielectric substrate thus forming a built-up deposit,

wherein said step of applying an alternating electric field is performed by:

a charge source comprising a solid dielectric member,

a first electrode in contact with one side of said solid dielectric member,

a second electrode in contact with an opposite side of said dielectric member, with an edge surface of said second electrode disposed opposite said first electrode to define an air region at the junction of said edge surface and said solid dielectric member, and

a source for applying an alternating potential between said first and second electrodes to induce ion producing electrical discharges in the air region between the dielectric member and the edge surface of said second electrode; and

collecting or recirculating the moving gas stream in a closed system.

Claim 60 (previously presented): A method for depositing particles onto a surface of a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;

providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby charged particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said dielectric substrate opposite said underlying electrode,

wherein said particles are electrically charged by triboelectric charging of said aerosol particles or induction charging of said aerosol particles; and

collecting or recirculating the moving gas stream in a closed system.

Claim 61 (canceled)

Claim 62 (original): The method according to claim 48, wherein said aerosol particles are charged outside of said deposition region.

Claim 63 (previously presented): A method for depositing particles onto a surface of a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;

providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said dielectric substrate opposite said underlying electrode,

wherein said aerosol particles are charged within said deposition region; and

collecting or recirculating the moving gas stream in a closed system.

Claim 64 (previously presented): A method for depositing particles onto a surface of a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;
moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;
providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said dielectric substrate opposite said underlying electrode,
wherein said electrically alternating field has a magnitude between about 1 kV/cm and about 30 kV/cm; and
collecting or recirculating the moving gas stream in a closed system.

Claim 65 (previously presented): The method according to claim 64, wherein said electrically alternating field has a frequency of oscillation between about 1 Hz and 100 kHz.

Claim 66 (previously presented): The method according to claim 64, wherein the duty cycle of the alternating field is adjusted to provide maximum efficiency of said particle deposition.

Claim 67 (previously presented): The method according to claim 64, wherein said electrically alternating field is formed between a first electrode positioned at one side of said deposition region opposite and facing said dielectric substrate and a second electrode contiguous to said dielectric substrate.

Claim 68 (canceled)

Claim 69 (previously presented): A method for depositing particles onto a surface of a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;

providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said dielectric substrate opposite said underlying electrode,

wherein the pattern of deposited material is defined by an electrically conducting mask disposed adjacent said charging means; and

collecting or recirculating the moving gas stream in a closed system.

Claim 70 (previously presented): A method for depositing particles onto a surface of a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;

providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said dielectric substrate opposite said underlying electrode,

wherein the aerosol particle mass flow is monitored whereby the mass of deposited particles is controlled; and

collecting or recirculating the moving gas stream in a closed system.

Claim 71 (previously presented): A method for depositing particles onto a surface of a dielectric substrate comprising the steps of:

forming an aerosol of said particles in a first region;

moving said aerosol as a moving gas stream to a second region and electrically charging said particles in said second region;

providing an alternating electric field between an electrode underlying said dielectric substrate and said aerosol particles in said second region whereby particles are removed from the gas stream and deposited as a built-up deposit of oppositely charged layers on the surface of said dielectric substrate opposite said underlying electrode,

wherein multiple deposits are made using multiple deposition regions supplied from a single aerosol source by multiplexing the application of the alternating deposition field between the deposition regions; and

collecting or recirculating the moving gas stream in a closed system.

Claims 72-73 (canceled)

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